

APPENDIX O

COMPUTER PROGRAM ABSTRACTS FOR REFERENCED PROGRAMS

O-1. Computer program abstracts included in Appendix O are: Bearing Capacity Analysis of Shallow Foundations (CBEAR); CFRAG - Seepage Analysis of Confined Flow Problems by the Method of Fragments; CSLIDE - Sliding Stability Analysis of Concrete Structures; Seepage Package; UTEXAS2-University of Texas Analysis of Slopes-Version 2; An Interactive Graphics Three-Dimensional Geometry Program; CSTR - Concrete Strength Investigation and Design of Hydraulic Structures; User's Guide for Concrete Strength Investigation and Design (CASTR) in Accordance with ACI 318-83.

CATEGORY A

CBEAR ELECTRONIC COMPUTER PROGRAM ABSTRACT			
TITLE OF PROGRAM Bearing Capacity Analysis of Shallow Foundations (CBEAR) (I0017)		PROGRAM NO. 741-F3-R0107	
PREPARING AGENCY US Army Engineer Waterways Experiment Station, Automatic Data Processing Center, PO Box 631, Vicksburg, MS 39180			
AUTHOR(S) Reed L. Mosher and Michael E. Pace		DATE PROGRAM COMPLETED June 1982	STATUS OF PROGRAM PHASE FINAL STAGE OPER
A. PURPOSE OF PROGRAM This program can be used for the analysis of the bearing capacity of shallow strip, rectangular, square, or circular foundations on one- or two-layer soil systems. The bearing capacity can be computed considering the effects of embedment of the foundation, inclination of the foundation base, inclined loads, a sloping soil surface, eccentric loads in three dimensions, submerged soil, or surcharge.			
B. PROGRAM SPECIFICATIONS Timesharing FORTRAN Program.			
C. METHODS The bearing capacity of an infinite strip footing is derived based on the classical theory of plasticity using limit equilibrium analysis. The soil behavior is assumed to be as follows: (a) Mohr-Coulomb failure criteria govern; (b) shear strength at any point is independent of strain; (c) elastic deformations are negligible with respect to plastic deformation; and (d) volume change due to stress is negligible.			
D. EQUIPMENT DETAILS			
E. INPUT-OUTPUT Data is input from a prepared data file in free field format or from the user's terminal during execution. If the data are input from a terminal the user may enter data by using key command words or by following a prompting sequence. Output from the program may be directed to a file or printed at the user's terminal.			
F. ADDITIONAL REMARKS Program is available through the <u>CORPS</u> on WES DPS/1, CSC H6000 at Macon, GA. A copy of the program and documentation may be obtained from the Engineering Computer Programs Library (ECPL), WES, telephone number: commercial (601) 634-2581 or FTS 542-2581.			

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CATEGORY A

CFRAG ELECTRONIC COMPUTER PROGRAM ABSTRACT			
TITLE OF PROGRAM CFRAG - Seepage Analysis of Confined Flow Problems by the Method of Fragments (I0018)		PROGRAM NO. 741-F3-R0108	
PREPARING AGENCY US Army Engineer Waterways Experiment Station, Automatic Data Processing Center, PO Box 631, Vicksburg, MS 39180			
AUTHOR(S) Michael E. Pace, Dennis R. Williams, Thomas F. Wolff, and Reed Mosher		DATE PROGRAM COMPLETED October 1983	STATUS OF PROGRAM PHASE STAGE OP
A. PURPOSE OF PROGRAM CFRAG is a seepage program designed to analyze groundwater flow using the method of fragments. The program can be used to compute: (1) seepage through soil mediums which can be model using fragments; (2) head losses; (3) exit gradients; and (4) resultant uplift and lateral forces.			
B. PROGRAM SPECIFICATIONS The CFRAG program is written in FORTRAN 66. The Corps time-sharing library file name is I0018.			
C. METHODS The method of fragments is an approximate analytical procedure for computing groundwater flow. The principle assumptions used in the derivation of this method are: (1) the flow is confined and of finite depth; (2) Darcy's law is valid, therefore, laminar flow exists; (3) steady state flow exists; (4) the soil medium is homogeneous and isotropic; and (5) equipotential lines at certain locations of the flow region can be approximated by vertical lines.			
D. EQUIPMENT DETAILS Time-sharing computer (Honeywell level 66, CDC Cyber, or Harris 500).			
E. INPUT-OUTPUT Input - Data may be supplied from a prepared data file or from the user's terminal during execution. If the data are input from the terminal, the user may enter data by using key command words or by following a prompting sequence. Output - Provides an echoprint of the input data and results of the analysis.			
F. ADDITIONAL REMARKS A copy of the program and documentation may be obtained from the Engineering Computer Programs Library, WES; telephone: (601) 634-2581 or FTS 542-2581.			

CSLIDE ELECTRONIC COMPUTER PROGRAM ABSTRACT			
TITLE OF PROGRAM CSLIDE - Sliding Stability Analysis of Concrete Structures (X0075)			PROGRAM NO. 713-F3-R0075
PREPARING AGENCY US Army Engineer Waterways Experiment Station, Information Technology Laboratory, PO Box 631, Vicksburg, MS 39180			
AUTHOR(S) Michael E. Pace and Virginia R. Noddin		DATE PROGRAM COMPLETED July 1986	STATUS OF PROGRAM PHASE STAGE OP
A. PURPOSE OF PROGRAM This program was developed to assess the sliding stability of concrete structures using the limit equilibrium method described in the Engineering Technical Letter (ETL) 1110-2-256.			
B. PROGRAM SPECIFICATIONS CSLIDE is written in FORTRAN 77.			
C. METHODS The program utilizes the limit equilibrium wedge method described in ETL 1110-2-256. The program performs an iterative search to find the failure surface with the minimum factor of safety. (Continued)			
D. EQUIPMENT DETAILS The program is operational on the Honeywell DPS-8 CDC Cyber, and Harris 500 computers in the time-sharing mode. Any ASCII time-sharing terminal may be used, but if graphics are desired a Tektronix 4014 terminal must be used.			
E. INPUT-OUTPUT Input - Data may be supplied from a prepared data file or from the user's terminal during execution. If the data are input from the terminal, the user may enter data by using key command words or by following a prompting sequence. All data are read in free-field format. Output - An echoprint of the input data and the results of the analysis in tabular and graphical form may be obtained.			
F. ADDITIONAL REMARKS A copy of the program and documentation may be obtained from the Engineering Computer Programs Library (ECPL), WES; telephone: (601) 634-2581 or FTS 542-2581. This program is designated X0075 in the <u>CORPS</u> Library.			

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C. METHODS (Continued)

CSLIDE can compute the factor of safety against sliding considering the effects of:

- a. Multiple soil layers with irregular surfaces.
- b. Water and seepage effects.
- c. Applied vertical surcharge loads which include line, strip, triangular, uniform, and ramp loads.
- d. Applied horizontal point loads.
- e. Irregular shaped structural geometry with either a horizontal or sloped base.
- f. A percentage of the base of the structure in compression due to overturning effects.
- g. Single or multiple failure planes.
- h. Horizontal and vertical induced loads due to earthquake accelerations.
- i. Factors which require the user to predetermine the failure surface.

CATEGORY B

FEMSEEP				ELECTRONIC COMPUTER PROGRAM ABSTRACT	
TITLE OF PROGRAM Seepage Package (X8202)			PROGRAM NO. 704-F3-R0009		
PREPARING AGENCY US Army Engineer Waterways Experiment Station, Information Technology Laboratory, PO Box 631, Vicksburg, MS 39180					
AUTHOR(S)		DATE PROGRAM COMPLETED		STATUS OF PROGRAM	
Fred T. Tracy		January 1983		PHASE	STAGE OP
A. PURPOSE OF PROGRAM					
To (1) interactively generate a finite element (FE) grid, (2) to perform a FEM seepage analysis, and (3) to plot the results.					
B. PROGRAM SPECIFICATIONS					
The driver runs in timesharing and calls X8200 (704-F3-R0006) for grid generation, 704-F3-R0011 for seepage analysis, and X8201 (704-F3-R0005) for post-processing.					
C. METHODS					
Four-sided isoparametric elements are used primarily in grid generation, the finite element method is used for the seepage analysis, and flow nets, contouring, vector, and number plots are used in the post processing.					
D. EQUIPMENT DETAILS					
Output is displayed on a storage tube terminal such as the Tektronix 4012 or 4014. The program is operational on Honeywell, CDC, and Harris computers.					
E. INPUT-OUTPUT					
Input/output is performed using a graphics terminal in the time-sharing environment.					
F. ADDITIONAL REMARKS					
The seepage analysis consists of steady-state solutions to plane or axisymmetric, confined or unconfined, and homogeneous or inhomogeneous problems. Documentation may be obtained from the Engineering Computer Programs Library (ECPL), WES, telephone number: commercial (601) 634-2581 or FTS 542-2581.					

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ELECTRONIC COMPUTER PROGRAM ABSTRACT			
TITLE OF PROGRAM		PROGRAM NO.	
UTEXAS2-University of Texas Analysis of Slopes-Version 2 (I0029)			
PREPARING AGENCY US Army Engineer Waterways Experiment Station, Information Technology Lab and Geotechnical Lab, PO Box 631, Vicksburg, MS 39180-0631.			
AUTHOR(S)		DATE PROGRAM COMPLETED	STATUS OF PROGRAM
(See reverse)			
		PHASE	STAGE
			OP
A. PURPOSE OF PROGRAM			
<p>UTEXAS2 is a slope stability program designed to analyze slopes by any of four methods. The program will calculate the safety factor for either a prescribed shear surface or for a search of the critical shear surface. Both circular and non-circular shear surfaces can be evaluated.</p>			
B. PROGRAM SPECIFICATIONS			
<p>The UTEXAS2 program is written in FORTRAN 77. The CORPS time-sharing library file name is I0029.</p>			
C. METHODS			
<p>The four analysis procedures are: Spencer's method, Simplified Bishop's procedure, Modified Swedish procedure with the Corps' side force assumption, and Modified Swedish procedure with Lowe and Karafiath's side force assumption. There are five options for type of shear strength data utilized and six options for specifying pore pressures. All analysis procedures and major features can be run in a single data file.</p>			
D. EQUIPMENT DETAILS			
<p>Microcomputer with a least 512K memory, a hard disk, and a math co-processor. Time-sharing computer (CDC Cyber, or Harris 500) with Tektronix 4014 terminal or emulator for graphics.</p>			
E. INPUT-OUTPUT			
<p>Input - Data is supplied from a prepared data file which allows for free-field input and requires command words.</p> <p>Output - Provides an echoprint of the input data and results of the analysis in an output file divided into a series of tables.</p>			
F. ADDITIONAL REMARKS			
<p>Graphics capability for displaying the input data and the final shear surface is available. A copy of the program and documentation may be obtained from the Engineering Computer Programs Library, WES, telephone: (601) 634-2581 or FTS 542-2581.</p>			

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EM 1110-2-2502
29 Sep 89

AUTHOR(S) (Continued).

Dr. Stephen G. Wright-Univ. of Texas, Austin; POC-Earl Edris, Geotech Lab and
Reed Mosher, Information Tech Lab

CATEGORY B

3DSAD		ELECTRONIC COMPUTER PROGRAM ABSTRACT	
TITLE OF PROGRAM An Interactive Graphics Three-Dimensional Geometry Program (X8100)		PROGRAM NO. 713-F3-R0008	
PREPARING AGENCY US Army Engineer Waterways Experiment Station, Automatic Data Processing Center, PO Box 631, Vicksburg, MS 39180			
AUTHOR(S)		DATE PROGRAM COMPLETED	STATUS OF PROGRAM
Fred T. Tracy		October 1978	PHASE OP STAGE
A. PURPOSE OF PROGRAM			
<p>Program allows user to describe the geometry of a three dimensional structure, interactively plot the described structure, and compute weight and centroid information for individual pieces or the sum total for the structure. Other modules of the program apply generalized loading forces and pressures and perform overturning and sliding analyses.</p>			
B. PROGRAM SPECIFICATIONS			
<p>FORTTRAN, Time-sharing program.</p>			
C. METHODS			
<p>Use a right handed coordinate system. Solid pieces of the structures may be described as (1) block - a two-dimensional cross-section extended in the third direction, (2) an eight node brick element, (3) a cluster of surfaces to form a solid.</p>			
D. EQUIPMENT DETAILS			
<p>Low speed graphics terminal, Central processor.</p>			
E. INPUT-OUTPUT			
<p>Input must be by a basic data file with addition and display commands entered. Output will be displayed directly on the terminal.</p>			
F. ADDITIONAL REMARKS			
<p>Program is available through the <u>CORPS</u> on WES G-635, CSC H600 at Macon, GA, and Boeing Computer Services.</p> <p>Reports include: 1. General Geometry Module 2. General Loads Module 3. General Analyses Module</p>			

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CATEGORY B

ELECTRONIC COMPUTER PROGRAM ABSTRACT			
TITLE OF PROGRAM CSTR - Concrete Strength Investigation and Design of Hydraulic Structures (X0066)		PROGRAM NO. 713-F3-R0066	
PREPARING AGENCY US Army Engineer Waterways Experiment Station, Automation Technology Center, PO Box 631, Vicksburg, MS 39180-0631			
AUTHOR(S) C. C. Hamby (LMKED-DS) and W. A. Price III (WESKA-E)		DATE PROGRAM COMPLETED September 1984	STATUS OF PROGRAM PHASE Operational
STAGE			
A. PURPOSE OF PROGRAM To perform investigation or design of concrete beams or columns in accordance with ETL 1110-2-265 for hydraulic structures.			
B. PROGRAM SPECIFICATIONS Written in FORTRAN IV using the Graphics Compatibility System (GCS). The CORPS time-sharing library file name is X0066.			
C. METHODS Strength analysis for investigation or design of rectangular cross sections of hydraulic structures subjected to axial load plus uniaxial flexure. Analysis is based on the rectangular stress block described in ETL 1110-2-265.			
D. EQUIPMENT DETAILS Tektronix 4014 terminal, if graphics output is desired, otherwise, any ASCII time-sharing terminal.			
E. INPUT-OUTPUT Input is from a data file; output is to a Tektronix 4014 graphics terminal or regular printing terminal.			
F. ADDITIONAL REMARKS A copy of the program and documentation may be obtained from the Engineering Computer Programs Library, WES; telephone: (601) 634-2581 or FTS 542-2581. The User's Guide for this program is WES IR K-84-9.			

ELECTRONIC COMPUTER PROGRAM ABSTRACT			
TITLE OF PROGRAM		PROGRAM NO.	
User's Guide for Concrete Strength Investigation and Design (CASTR) in Accordance with ACI 318-83		713-F3-R0067	
PREPARING AGENCY US Army Engineer Waterways Experiment Station, Information Technology Laboratory, PO Box 631, Vicksburg, MS 39180-0631			
AUTHOR(S)		DATE PROGRAM COMPLETED	STATUS OF PROGRAM
C. C. Hamby (LMKED-DS) and W. A. Price III (WESKA-E)		October 1985	PHASE Operational
STAGE			
A. PURPOSE OF PROGRAM			
To perform investigation or design of concrete beams or columns in accordance with ACI Code 318 for nonhydraulic structures.			
B. PROGRAM SPECIFICATIONS			
Written in FORTRAN IV using the Graphics Compatibility System (GCS). The CORPS time-sharing library file name is X0067.			
C. METHODS			
Strength analysis for investigation or design of rectangular cross sections of nonhydraulic structures subjected to axial load plus uniaxial flexure. Analysis is based on the rectangular stress block approximation described in Section 10.2.7 of ACI 318-83.			
D. EQUIPMENT DETAILS			
Tektronix 4014 terminal, if graphics output is desired, otherwise, any ASCII time-sharing terminal.			
E. INPUT-OUTPUT			
Input is from a data file; output is to a Tektronix 4014 graphics terminal or regular printing terminal.			
F. ADDITIONAL REMARKS			
Input data are prepared the same as for program 713-F3-R0 066, "CSTR-Concrete Strength Investigation and Design of Hydraulic Structures (X0066)." Differences between the two programs lie only in the stress block depth and other parameters. Call WES, (601) 634-2300 or FTS 542-2300 for more information.			